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Is H.A. Simon a Theoretician of Decentralized Planning? A Comparison with F.A. Hayek on Planning, Market, and Organizations

Herbert A. Simon acknowledged Friedrich A. Hayek as a founder of the notion of bounded rationality; yet Simon considered Hayek's perspective incomplete, and, more in general, their views on market mechanisms, planning, and organization exhibit considerable differences.

The comparison between these authors sheds light on Simon's interpretation of planning, which emerges within his theory of organization (and not in traditional debates on socialism). Contrary to Hayek, he maintained that planning, in specific circumstances, is more advantageous than the market; and in both administration and organization, it involves a decentralized structure based on near independent sub-units. Decentralization of decisions also appears in social planning, which evolves through continuous interactions among planners (i.e., agents and institutions), and it is a process connoted by the absence of "fixed goals". Finally, Simon defined modern economies more in terms of "organizational economies" than in those of "market economies" and this highlights a further difference with respect to the Austrian economist. This leads to analysis of the nature of organizations as hierarchical and "near-decomposable" structures, which refers to Simon's theory of complexity and gives an epistemological explanation to the relation between centralization and decentralization.

JEL CLASSIFICATION: B 19; B 40; D 21; D 40; D 8; L 2

Key words: planning; market; organizations; bounded rationality; complexity

Introduction

There are few direct intellectual connections between Friedrich A. Hayek and Herbert A. Simon. Yet Simon, in some circumstances, recognised Hayek's fundamental role in describing and providing arguments for *bounded rationality* (henceforth, BR). This opinion, although only sketched, was reiterated over time (Simon *et al.* 1992; March and Simon, 1993 [1958]; Simon, 1983, 1991a, 1996 [1969]).

Probably the best known acknowledgement appears in *The Sciences of the Artificial*, where Simon maintains that

“No one has characterized market mechanisms better than Friedrich von Hayek [...] His defense did not rest primarily upon the supposed optimum attained by them but rather upon the limits of the inner environment – the computational limits of human beings” (Simon 1996 [1969], p. 34).

Yet, this favourable judgement on Hayek notwithstanding, a few lines later Simon puts forward some non-Hayekian arguments. In particular, contrary to Hayek's theory on central role of the market, he states "the reasons why all economic activities are not left to market forces" but are mostly fulfilled by organizations, which in general are characterized by decentralized structures (Simon 1996 [1969], p. 35 and ff.). In short, despite Simon's partial acceptance of Hayek's perspective, the outcome is a radical reformulation of certain fundamental concepts.

In what follows I shall seek to show the differences that emerge when one compares Hayek's and Simon's theories on planning, market, and organization, starting from the shared elements in their notions of BR. In particular, section 1 describes in essential terms how Simon's juvenile representations of planning and the market were linked to the intellectual climate of the "Chicago school" of political science. Sections 2 and 3 discuss why, according to Simon, BR cannot be simply treated as an argument in favour of market mechanism as - he said - Hayek maintained. A crucial role in Simon's analysis is played by the notion of planning (which should be interpreted in light of his theory of the organization as a decentralized mechanism), and by the idea that, *under specific conditions*, planning furnishes advantageous procedures for decision-making. Sections 4 and 5 treat Hayek's and Simon's differences as regards the notion of social planning in more theoretical terms. Section 6 shows how Hayek and Simon gave different explanations of coordination systems in modern economies: the former pointed out the prevalent role of the market as a spontaneous order; the latter stressed the fundamental function of organizations (that is, distinctive planning structures). Section 7 examines the notion of organization as a part of Simon's general theory of complexity, and in particular how the epistemological concepts of "hierarchy" and "near decomposability" shed light on the functioning of modern economic systems, although his analysis of the market is problematic in some respects.

This comparative analysis provides an unusual portrayal of Simon: that of a distinctive theoretician of planning (in particular of decentralized planning), although he never set out a systematic theory but rather elaborated a set of concepts closely

related to his main strands of research. First, the advantages of different economic systems must be measured on empirical grounds, weighing costs and benefits. And this perspective, in different ways, characterizes both Simon's juvenile and mature work. Second, his view on planning is framed within organizational theory and contrasts with that of socialist central planning. In this sense, theory of organization is part of the problem. Third, planning both in firms and in central administration necessarily implies decentralization in order to govern complexity by means of sub-units whose task is to break complex problems down into more tractable sub-problems. More in general, a number of actors intervene by constantly modifying the original planning of the central administration by means of their decentralized choices. Continuous interaction consequently arises between the "members of an organization or society" and institutional planners, and agents' behaviours take the form of adaptive responses to the plan. Fourth, Simon refined his theory over time, and when he applied the notion of "social planning without fixed goals", he delineated an evolutionary concept of planning as a coherent part of the *sciences of the artificial* epistemology. Fifth, this latter involves his theory of complexity, which represents economic systems as sets of relations among organizations (and among their sub-units, which exhibit some degrees of independence) rather than as market coordination. As a consequence, the notions of "hierarchy" and "near-decomposability" once again show that decision-making processes in organizations are essentially decentralized, and that the units of analysis used to explain decentralization are organizations (with their departments), not individuals, who are subsumed in these structures.

Parts of these topics emerge from direct comparison with Hayek; others arise from indirect comparison between the authors. In short, on the one hand analysis of Hayek's and Simon's theories makes it possible to delineate theoretical differences between the two economists (contrary to the increasingly widespread opinion that they can be considered complementary thinkers, in that they endorsed non-neoclassical views and adopted the concept of bounded rationality); on the other hand, it enables light to be shed on a less evident aspect of Simon's thought: his theoretical approach to planning.

1. A short historical (and biographical) preamble

Simon was deeply involved in the Chicago intellectual milieu both as a student and subsequently as a member of the Department of Political Sciences in the 1930s. In the post-Great Depression climate, the figure of Charles E. Merriam, chairman of the department, was highly influential (Simon, 1991b, pp. 55-63). In particular, the basic tenet of the “Chicago School” of political science was that “conscious, rational coordination [...] was essential for democracy as well as for efficiency”, and Merriam and his colleagues were convinced that “Societies needed to be led and economies needed to be regulated for there to be progress” (Crowther-Heyck, 2005, p. 44). Merriam’s philosophy was applied by the city manager movement (during the 1920s and 1930s), and to federal, state, and local planning (in the 1930s) and, an empirical issue was Merriam’s collaboration with the National Resources Planning Board.

Another important experience for Simon was shared with Clarence Ridley, director of the International City Managers’ Association, and it culminated in *Measuring Municipal Activities* (1938), a book in which the authors focused on the “measurement of planning”, and on the need to possess information in order efficiently to evaluate interventions in every sphere of planning (Ridley and Simon, 1943, p. 67; Simon, 1991b, pp. 64-65 and 70-72; Augier and March, 2002, p. 4). In fact, Ridley and Simon were convinced that city planning made it possible to integrate the dispersed needs of the public into a rational plan. For these reasons, as regards this period, Simon as “the quintessential product of Chicago social science in the 1930s” has been called “a strong advocate of rational planning” (Crowther-Heyck, 2005, pp. 58 and 94). Therefore, it is from this perspective that the following sentence can be interpreted: “There is no *a priori* reason why the community should select the competitive market as the institutional means of organizing its activities, any more than it should select a governmental organization” (Simon, 1941, p. 326).¹

¹ In similar vein, Simon maintains: “There does not seem to be any valid reason why the revenue-expenditure process in governmental agencies need be characterized by less ‘rationality’ or ‘free choice’

Simon's juvenile experiences probably influenced the subsequent phases of his intellectual career, the change in his theoretical tools notwithstanding², as one infers from this telling sentence: "I was (and am) a new Deal Democrat, probably imprinted by Franklin Delano Roosevelt's inaugural address" (Simon, 1991b, p. 119). Hence, the following sections will discuss, among other things, how the theme of planning and centralization was dealt with in his mature thought. The thesis is that Simon's idea of a decentralized planning was later brought into consonance with his theories on BR, organizations, and complex systems.

2. Central Planning as a Decentralized System

Two arguments are closely connected in Simon's discourse on planning and the market: his criticism against "*a priori*" assumptions, and the role of BR.

As regards the first concept, Simon always declared that he held an empirical view of science. This methodological approach, applied to the comparative analysis of planning and the market, appeared in embryonic terms in the above mentioned statement of 1941, and re-emerged over time.³ In particular, it plays a special role in *Organizations* (1958), where he argues that the relationship among BR, coordination, centralization and decentralization must be evaluated "in each case by reference to the empirical facts", and not by "*a priori*" considerations. In fact, "imperfections" of both

than the private revenue-expenditure process – albeit the institutional framework through which the rationality is achieved and the choice exercised may be very different in the two cases" (Simon, 1941, p. 330).

² When in the mid-1950s Simon devoted large part of his research to artificial intelligence, his theoretical tools profoundly changed, and his analysis of decisional processes (especially in the form of problem solving) assumed a new form. On this topic, see Sent (2000). Augier (2000) argues for the continuity of Simon's scientific interests throughout his scholarly life. In my view, there is continuity as regards the objects of Simon's research, i.e., decision-making processes (also in terms of problem solving); yet the approach provided by artificial intelligence from the mid-1950s onwards brought drastic change to his treatment of decision-making.

³ In fact, also in his mature work, Simon claims the need for empirical analysis (contrary to *a priori* assumptions): "great plan versus no plan debate hinges in considerable measure upon empirical propositions about how price mechanisms in fact operate: what costs they impose of information gathering and computing; how stably and rapidly they adjust the system to environmental changes." (Simon, 1962b, p. 70).

the market (externalities) and the centralized systems (limits on information and of computation) produce disadvantages, which must be weighed and compared (March and Simon, 1993 [1958], p. 226).⁴

According to Simon and March, this approach is not followed by Hayek, who moreover refers to BR to provide arguments in favour of the price mechanism, as appears in a long passage of *The Road to Serfdom*, which they quote. The logical conclusions of Hayek's ("a priori") argument, they say, is that the market mechanism is more advantageous than centralized systems the more that complex situations occur (since these are characterized by a large amount of dispersed information which cannot be collected by the central planner). Yet this hypothesis must be tested, and – they state – the best test is to consider a modern economy under wartime conditions, because the implicit assumption is economic systems are *more complex* in wartime than in peacetime. If this is so, since “under wartime conditions the pricing mechanism is partially displaced by central planning” (March and Simon, 1993 [1958], p. 227), then Hayek's perspective is confuted. The basis of Simon's reasoning is the work of Ely Devons: an “insightful” English economist who participated in the planning of aircraft production in Great Britain during World War II (Devons, 1950).⁵ There are a number of arguments to which the authors refer, drawing on Devons' work, in order to explain why planning replaces the market in wartime conditions. One of them is that, when the “goal” is winning the war, the price mechanism encounters the difficulty of estimating “the marginal contribution of activities to the goals” (March and Simon, 1993 [1958], p. 229). Moreover, in the market “the information needed by individual decision makers to set marginal costs equal to prices is most easily accessible to those decision

⁴ According to the authors “The fundamental theorems of welfare economics – both the classical one and Barone's – assert that under certain circumstances the decentralized price mechanism will give *as good* a result as central planning; the theorems do not give us any *positive reason for preferring* the former to the latter” (March and Simon, 1993 [1958], p. 224). Note that Simon came to know Walras' theory of general equilibrium through Henry Schultz's lectures at the University of Chicago. Schultz's successor was Oskar Lange, who also taught Simon (1991b, pp. 51-53). H. Schultz and H.L. Moore disseminated Pareto's thought in the United States between the 1920s and 1930s, and O. Lange was a prominent participant in the debate on market socialism, his views being at least partially inspired by Pareto and Barone (see Marchionatti, 2006).

makers”, yet if this condition is not fulfilled, as happens in wartime economies, “the argument for decentralization and the argument for the price mechanism become separate and distinct” (March and Simon, 1993 [1958], p. 229), because the market is not the sole decentralized system, and others must be considered. More precisely, according to the authors, “decentralization without prices” (March and Simon, 1993 [1958], p. 226) is possible.

In short, by means of Devons’ analysis, Simon and March stress “*some of deficiencies of the price mechanism for wartime decision-making*” (March and Simon, 1993 [1958], p. 229, emphasis added), show why some complex situations, which imply uncertainty and agents’ BR, cannot be resolved by the usual market processes, and they put forward the thesis that decentralization does not uniquely connote the market.

In fact, the complexity characterizing certain specific contexts can only be adequately handled by means of a particular type of “planning”, which “*involved many elements of decentralization, but using devices other than prices for coordination*” (March and Simon, 1993 [1958], p. 229, emphasis added). Through Devons’ words, Simon and March point out that the centralization of decisions ensured the coordination of individual actions, but the difficulties of administration required the delegation of “decisions to separate, largely self-contained units of administration” (Devons quoted in March and Simon, 1993 [1958], p. 230; cf. Simon et al., 1955). This co-existence of planning and decentralization depends *precisely* on the presence of BR, because “planner” and administration are “inevitably” connoted by the boundedness of human capacities and cannot handle a huge amount of data. In particular, BR generates a process in which the search for a (“satisficing”) solution for a problem implies decomposition of the latter into sub-problems, which are more tractable by rationally limited agents, and the same procedure characterizes the action of administrations connoted by limited capacities (Devons quoted in March and Simon, 1993 [1958], p. 230). In this way, by referring to Devons’ empirical analysis, it is possible to show how

⁵ For analysis of the relations between Simon’s thought and the intellectual climate during and after World War II, in connection with the influence of cyborg science, see Sent (2000) and Mirowski (2002). A

BR enters the scene not as an argument in favour of the market, but as a fundamental element in explaining how decentralization works within planning.

In short, given this framework, which reflects arguments put forward in previous works on administrative organization (cf. Simon, 1976 [1947], pp. 35-38 and 234-240):

- a) central planning involves the decentralization of decisions;
- b) this kind of decentralization derives from human BR.

2.1 Central planning and firm's planning: Homologies

A fundamental point is that March's and Simon's analysis allows definition of the link between central planning and organizations, since central planning is nothing other than the result of decision-making by a specific organization: the administrative organization.⁶ Macro and micro-analysis are closely connected, and as a consequence March and Simon explain the light that "planning debate cast[s] on the decision making within individual firm" (March and Simon, 1993 [1958], p. 230). This perspective permits comparison between administrative and firm planning. An issue arises, however: within an organization subdivided into "sufficiently independent" departments (the analogues of administrative, separate, units), the internal use of prices is a useful mechanism for decentralized decision-making only when external economies are not present, and if decision-makers possess techniques with which to calculate marginal costs and returns, otherwise:

"In the absence of such techniques, prices may not be an effective mechanism for decentralization. Hence, the movement toward decentralized decision-making within organizations cannot be limited to the internal use of prices." (March and Simon, 1993 [1958], p. 231)

more general treatment is in Edwards (1997).

⁶ "'Planning', broadly defined, is of course indistinguishable from other kinds of decision-making" (March and Simon, 1993 [1958], p. 221; see pp. 44-48).

Moreover, the same need to break a problem down into more tractable sub-problems, which imposes decentralization in central administration, operates in individual organizations, where sub-goals (i.e., types of sub-problems which require “satisficing” solutions) are assigned to organizational sub-units (March and Simon, 1993 [1958], p. 173).

In conclusion, planning in both firms and administration essentially involves organizational problems of the same kind, and it must be considered, in the light of organization theory, as a decentralized system (Goodin, 2004, pp. 236-237). In this sense, Simon and March are very far from conceptions of planning both traditional and probably inspired by a certain Walrasian tradition.⁷ In particular, socialist central planning, Simon later maintained, relies on the figure of the omniscient “designer” able to define all details of a plan, whilst social planning is an interactive process deriving from a myriad of decentralized decisions (see sect. 4). Thus “Marxist fundamentalists” are compared to “Christian fundamentalists”. These latter, in reaction to Darwin’s theory, conceived “no design without Designer”, the former “reacted in a similar way when, after World War I, they undertook to construct the new socialist economies of eastern Europe” (Simon, 1996 [1969], p. 34).

3. The role of prices: Simon’s and Hayek’s views

Simon’s and March’s discussion on the market and decentralized planning is obscure in some passages. Moreover, it is rather unclear why the best “test” for evaluating whether the price mechanism is more effective than planning should be analysis of an economic system under wartime conditions. Why should economics in wartime be considered more complex than in peacetime (i.e., arguments should be put forward in support of this thesis), and not as an exceptional circumstance? Is the Great

⁷ “The picture (or perhaps, nightmare) of planning as the solution of almost unimaginable numbers of simultaneous equations can be replaced by a picture of planning as the construction of a series unrelated [or more appropriately ‘loosely coupled’] actions programs” (March and Simon, 1993 [1958], p. 197).

Britain case in World War II really representative? Why not refer to other similar cases by means of comparative analysis coherently with their empirical approach?

The assumption based solely on that kind of “test” is striking (and partially unconvincing). Yet, all this should be interpreted in light of Simon’s conviction (which he specified better with time) that the market, *per se*, does not always assure stability and rapid adjustments (Simon, 1962b, p. 70), and that in modern economies organizations perform a more relevant role of coordination than the price system does. In this sense, it is significant that, whilst Simon revised some of his works over time (e.g., *Administrative Behavior*, and *The Sciences of the Artificial*), he - with March - did not modify *Organizations*, whose “Second Edition” appeared in 1993, although in the new *Introduction* they specified which parts required new treatment thirty-five years later, without including the last sections of the work.

All this probably explains why the arguments treated in the final pages of this book were resumed many years later in Simon (1991a) *in a new context*, which in Simon’s view allowed their *generalization*. In this well-known article, Simon once again summarizes Devons’ analysis, which is opposed to Hayek’s, and his thesis on the reasons for preferring central planning, in certain circumstances.⁸ He also points out that

“Prices perform their informational function when they are known or reasonably predictable. *Uncertain prices* produced by unpredictable shifts in a system reduce the ability of actors to respond rationally”. (Simon, 1991a, p. 40; emphasis added)

This statement reflects Simon’s *general* conviction that it is not only in wartime conditions that prices do not correctly perform their informational role because they are altered by the presence of externalities and of public goods (Simon, 1983, p. 76). More precisely, Simon recognizes that prices reduce, under specific conditions, the need of (rationally limited) individuals for information. Yet, if uncertainty on prices prevails,

the market, instead of improving the individual capacity to make correct decisions, “reduce[s] the ability of actors to respond rationally”; and this view makes the difference with respect with other approaches.

In particular, in both the neoclassical and Hayekian approaches, their basic theoretical differences notwithstanding, prices perform an important role in guiding individual choices. The market system is “a mechanism for communicating information” by prices (Hayek, 1945, p. 86), and these latter “serve [...] as indicators of what ought to be done in the present circumstances”, because prices incorporate information (about technical efficiency, changes in the relative scarcities of “materials” and factors, etc.) and this function is “wholly the product of competition” (Hayek, 1976, pp. 116-118). By contrast, Simon describes the consequences deriving from “uncertain prices”, which require recourse to “satisficing” procedures and a search for information not based on price signals. In fact, under these conditions prices cannot communicate reliable information: therefore the market, as a price mechanism, is neither the only nor, perhaps, the most important system of economic coordination, and others replace it (see sect. 5).⁹ Now, with respect to the analysis of *Organizations*, the alternative system which replaces the market is not an administrative central planning system, but the network of organizations (where, we have seen, the former and the latter share important characteristics). As a consequence, as we will see, the focus must be shifted to the role of organizations and their predominance in economic systems. In fact, “The economies of modern industrialized society can more appropriately be labelled organizational economies than market economies” (Simon, 1991a, p. 42).

Markets are important mechanisms of coordination; yet they cannot fulfil their function if they do not possess “a high degree of economic stability and a low level of

⁸ When “the qualifying conditions for stability of markets are not met, as, for example, in wartime, we see a rapid movement toward centralized planning as the preferred coordinating mechanism for many activities” (Simon, 2000, p. 751).

⁹ Thomsen opposes Austrian (and Hayekian) market-process approach to Simon’s. In the former, the function of (disequilibrium) prices is to provide profit opportunity and stimulate competitive discovery, whilst for Simon prices merely summarize information that economizes on the computational limits of agents (Thomsen, 1992, p. 82; cf. Kirzner, 1984). The problem is that, for Simon, markets are rarely able to reduce the need for information and computation, owing to their instability and the presence of externalities. As a

externalities” (Simon, 2000, p. 751). Despite these problems, economists usually neglect consideration of how organizational procedures determine non-market coordination. In fact, coordination by means of “adjustment of quantities”, both among organizations and between them, often plays a more important role in the real world than do coordination and allocation by means of prices (Simon, 1991a, p. 40). Consequently, the function of the market as an allocation system based on price signals is, in certain circumstances, limited (see sects. 6-7). In particular, Simon stresses the differences with respect to Hayek’s approach, as follows:

“In arguing for markets as mechanisms for simplifying choice, whittling it down to a size where human minds can deal with it, von Hayek undoubtedly exaggerates the role of prices as the only or chief coordinating device in markets [...] when we regulate inventories, we do so largely by quantity responses rather than price responses. So perhaps von Hayek was wrong in giving price the very privileged place they occupy in his article [Hayek, 1945], but he was very right about what markets and economic exchanges are all about – how they make it possible for people of bounded rationality to make reasonable choices. So it is a complex picture. Bounded rationality appears very Austrian in some dimensions and very anti-Austrians in others.” (Simon *et al.*, 1992, p. 27).

In sum, between 1958 and 1992 Herbert A. Simon delineated a perspective in which BR is linked to non-market coordination.¹⁰ More precisely, BR was linked to a particular view of “planning” which differs profoundly from Hayek’s. All this defined a specific role for organizations.

The analytical differences between Simon and Hayek can therefore be highlighted by referring to the concepts of planning and organization from a more general and theoretical perspective.

consequence, “uncertain prices” neither communicate reliable information nor stimulate competitive discovery procedures. For this reason they are often replaced by other mechanisms of coordination.

¹⁰ Simon points out that market, in some cases, does not provide an answer for either externalities or uncertainty. Negative externalities are often dealt with by “administrative answers”, instead of “answers given by an automatic market mechanism”. Moreover, “uncertainty calls flexibility, but markets do not always provide the greatest flexibility in the face of uncertainty. All depends on the sources of the uncertainty”, which

4. Social planning, constructivism and spontaneous order: Hayek's perspective

Hayek's criticism of social "planning" was based theoretically on a critique of the notion of "constructivism" or "rationalist constructivism". According to this vision, Hayek maintained, human institutions emerge by deliberate design in order to accomplish human purposes (Hayek, 1946; 1952 [1941-1944]; 1960; 1967 [1965]; 1978 [1970]; 1988). On Hayek's view, this is an erroneous conception, which also has dangerous effects if it induces political, social and economic interventions. In fact, "designed theories [...] lead directly to socialism" (Hayek, 1946, p. 10);¹¹ therefore constructivist ideologies constitute a serious threat to Western civilization¹².

Hayek opposed the "spontaneous order" explanation of the emergence of institutions (the market included) against constructivist theories. According to the "spontaneous order" theory, complexes of practices or rules of conduct "prevailed because they made a group of men successful" (Hayek, 1973, p. 17), and they "were preserved because they enabled the group in which they had arisen to prevail over others" (Hayek, 1973, p. 9). These rules arose spontaneously, and they were unintentionally selected for their advantages. Therefore, the unintentional order of society was explained by resorting to the notion of cultural selection. This evolutionary process had connoted Western societies and their institutions (in particular, the market), and it was characterized by "abstract" and non-coercive rules (cf. Hayek, 1967a, p. 72).

In short, according to Hayek, "constructivism" led to the application of social planning because it assumed that the "engineering" mind of the legislator could deliberately create a social order. By contrast, the "spontaneous order" explanation

determines whether resorting to organizations rather than the market is preferable (Simon, 1996 [1969], pp. 42-43).

¹¹"It is from this kind of social rationalism or constructivism that all modern socialism, planning and totalitarianism derives" (Hayek, 1967 [1965], p. 85; cf. pp. 91-95).

¹²"We are not far from the point where the deliberately organized forces of society may destroy those spontaneous forces which have made advance possible" (Hayek, 1960, p. 38). See also Hayek (1967 [1965], p. 94).

postulated that the social order emerged by virtue of evolutionary, unintentional, processes. Consequently, these theoretical approaches represented a clear, conceptual, dichotomy.

5. Simon and social planning as an interactive process¹³

Hayek's dichotomy between constructivism and spontaneous order could not be accepted by Simon, whose general assumption was that both natural and artificial systems exhibit adaptive and evolutionary features (Simon, 1996 [1969], pp. 6 and 149), where artificial systems include human institutions created for specific purposes.

In this perspective, it is possible to analyze the relation between society as a social "client" and a (social) planner. In fact, the planning of changes (for example, in a town) engenders a number of unintended changes which cannot be foreseen by the original plan, since the latter exerts its direct influence only on a finite domain. In other words, fulfilment of the plan produces unintended results. Moreover, the thesis that artificial and natural (biological) systems exhibit similar features enables their examination in terms of dynamic, evolutionary, processes. In fact, "society as client", and social institutions as the planners exhibit a peculiar interaction:

"The members of an organization or a society for whom plans are made are not passive instruments, but *are themselves designers* who are seeking to use the system to further their own goals [...]. A not dissimilar representation of the social planning process views it as a game between the planners and those whose behavior they seek to influence. The planners make their move (i.e., implement their design), and those who are affected by it then alter their own behavior to achieve their goals in the changed environment." (Simon, 1996 [1969], pp. 153-154; emphasis added. Cf. Simon, 1961, pp. 189-190).

Since bounded rationality characterizes every decision-maker, neither individuals nor institutions can mould society by means of social planning able to define in every

detail its present and future configuration. Rather, a continuous interaction between different designers occurs, since the “society as client” is itself, in turn, a planner. As a consequence, this process is describable in terms of “social planning without fixed goals” (Simon, 1996 [1969], p. 165), and every step in the interaction constitutes a new base for the emergence of new plans.

“It is also beside the point to ask whether the later stages of the development were consistent with the initial one - whether the original designs were realized. Each step of implementation created a new situation; and the new situation provided a starting point for fresh design activity.” (Simon, 1996 [1969], p. 163).

Contrary to Hayek’s notion of constructivism, as static planning able to “block the future progress” (Hayek, 1997 [1944], p. 152) (that is, evolutionary, spontaneous, processes), new purposes and new social configurations emerge purely from a dynamic interaction among different plans, which can be interpreted as an adaptive and creative response to environment changes. For this reason, society is an “evolving artifact” (Simon, 1996 [1969], p. 139), and social planning is an *endless process* able to engender unintentional outcomes (Simon, 1996 [1969], pp. 165-166). Finally, it should be pointed out that this kind of analysis implies that agents adopt procedural rationality in order to solve new problems generated by a changing environment which require them constantly to “alter their own behavior to achieve their goals”. In spite of the diverse analytical contexts, Simon’s and Hayek’s treatments of the notion of social planning can be compared.

In Hayek’s theory, institutional interventions are admissible only if they are consistent with spontaneous, evolutionary, processes (Hayek, 1973, pp. 45-46; cf. Ioannides, 2003, p. 541); otherwise they must be considered constructivist, dangerous, acts.¹⁴ By contrast, for Simon, social planning is a coherent part of endless and unintentional processes, and not the consequence of constructivist mentality.

¹³ The arguments of this section are treated more extensively in ...PAPER OF THE AUTHOR.

¹⁴ “The principle of rule of law” is what determines the legitimacy of state action; yet what institutions can do to improve spontaneous order, that is, a designing intervention, is only “somewhat

Note that Simon and Hayek share the conviction that no (individual or institutional) mind possesses both complete information and perfect foresight (March and Simon, 1993 [1958], pp. 225-226; Simon, 1996 [1969], p. 34). Yet, the analysis of the action of BR leads these authors to different conclusions. On the one hand, for Hayek, planning and deliberately organized forces “may destroy” spontaneous, evolutionary, orders (Hayek, 1960, p. 38). Therefore, the planner’s fixed goals matter. On the other hand, according to Simon, it is precisely the BR of the institutional planner (the possibility to control only few variables of its plan) that permits both interaction with other decision-makers and the continuous modification of the original plan. Therefore, the planner’s fixed aims may have a marginal role. As a consequence, Hayek’s radical distinction between constructivism (planning) and evolutionism breaks down and, contrary to Hayek, Simon’s limited information and BR provide the explanatory key for the representation of deliberate, institutional, interventions in evolutionary terms¹⁵. Finally, this is also coherent with the image of the bounded rationality of administration in wartime, where, in Devons’ words, the larger the basis involved in central decisions, “the fewer [are] the relationships that can taken into account” (Devons quoted in March and Simon 1993 [1958], p. 231). Therefore, on connecting the statements of *Organizations* and *The Sciences of the Artificial*, it emerges that central planning not only requires forms of decentralization in both administration and firms but also generates unintended outcomes, because decentralized choices by decisional units (the “members of an organization or a society”) cannot be entirely directed by decisional centres.¹⁶

obliquely” suggested by Hayek (Barry, 1979, pp. 105-123). Also Vanberg (1994, chaps. 5 and 6) asks which rules (and which criteria) could be considered suitable for improving the market mechanism, and in his view Hayek’s arguments are “somewhat ambiguous” as regards the desirability of rules (p. 102). This leads to the constitutional political economy approach, which addresses the problem of how to appropriately design and modify rules and institutions, sometimes seeking convergence with Hayekian perspective. This convergence is possible, according to Caldwell (2003, pp. 358-359), although he recognizes that Hayek is “ambivalent” about the problem of conceiving designs for general rules of society.

¹⁵ Adaptive systems, forged by evolution, are connoted by homeostatic and feedback mechanisms and production of variety. Given these peculiarities, “Social planning without fixed goals has much in common with the processes of biological evolution” (Simon 1996 [1969], p. 165).

¹⁶ Thomsen criticizes Simon on the ground that the BR approach implies that the planner could operate with more success than the market if he was able to master complexity, i.e., if the number of

6. Markets and organizations: Simon's and Hayek's general views

Simon's and Hayek's approaches display profound differences in their definitions of the role of markets and organizations. For Hayek, the latter are characterized by opposite rules, although organizations are integrated into the market system. By contrast, in Simon's work, the boundaries between these mechanisms of coordination are not always well defined. More in general, according to Hayek, the market, as a spontaneous order, is the fundamental structure for coordinating individual decisions and providing "relevant information" to agents, whereas in Simon's view, a plurality of coordination systems characterize modern economies, and among them organizations play a distinctive role.

Hayek clarifies this point as follows:

"What distinguish the rules which will govern action within an organization is that they must be rules for the performance of *assigned tasks*. They presuppose that the place of each individual in a *fixed structure* is determined by *command* and that the rules each individual must obey depend on the place which he has been assigned and on the particular ends which have been indicated for him by the commanding authority." (Hayek, 1973, p. 49; emphasis added).

Moreover, the term "economy" must be applied to the planned activity of organizations, as opposed to that of "market order" (Hayek, 1976, p. 107). Therefore, if an economic system is treated as an organization which pursues specific ends, the outcome is similar to that represented by central planning. In fact,

variables did not exceed his computational limits (Thomsen, 1992, p. 81). However, this hypothesis fails to consider that, for Simon, social planning is an interactive, decentralized, process (and not a static state), which cannot be governed by any designing mind. On the one hand, planning is sometimes empirically more efficacious than the market; on the other, it involves complex processes which cannot normally be directed by a rationally limited legislator.

“whenever we speak of the economy of a country, or of the world, we are employing a term which suggests that these systems ought to be run on socialist lines and directed according to a single plan so as to serve a unitary system of ends.” (Hayek, 1976, p. 108)

“By contrast, the rules governing a spontaneous order [for example, the market], must be independent of purpose” (Hayek, 1973, p. 50).

The opposition between the “abstract rules” of spontaneous orders and the specific “commands” of organizations is a fundamental distinction for Hayek, and the problem of how organizations can be integrated without frictions in the market’s spontaneous order requires additional explanation. Langlois, for example, maintains that organizations (firms) and markets are both systems of rules of conduct; they are made of the same “stuff”, namely capabilities; and they are characterized by individuals who pursue specific goals. In particular, firms’ performances are connoted by unintended outcomes. Hence Hayek’s spontaneous order can include “extramarket forms” because the distinction between order and organizations is “a matter of degree” (Langlois, 1992; 1995). Foss (1997) emphasizes that firms are “cognitive entities”, although he points out the difficulty of finding a precise boundary between spontaneous and planned orders (Foss, 1994, p. 40). Ioannides points out that the consequences of Hayek’s discourse make it possible to consider business firms in terms of process, consistently with an evolutionary approach. In fact, commands in organizations prevail when they are connoted by a limited amount of complexity. Yet, if complexity and abstractness increase, then organizations tend to be governed by rules, and not by commands. More precisely, commands tend to assume generality “thus blurring the distinction between rules and commands” (Ioannides, 2003, p. 556).

In general, attention is focused on the role of knowledge (and tacit knowledge), the use of which implies that firms partially work as a spontaneous order. This perspective, in my view, is coherent when Hayek considers the firm as an individual (that is, a whole, an indivisible entity)¹⁷, because coordination among organizations (as

¹⁷ “What in fact we find in all free societies is that, although groups of men will join in organizations for the achievement of some particular ends, the co-ordination of the activities of all these *separate organizations*, as well as of the *separate individuals*, is brought about by the forces making for a spontaneous

among individuals) emerges in terms of spontaneous order. Hayek, like Simon, recognizes the increasing role of organizations in modern economies, but – contrary to Simon – he does not envisage them as replacing the market. In particular, he maintains that the more the spontaneous order extends, the more “its elements will not be economies of individuals, but of such organizations as firms and associations, as well as of administrative bodies” (Hayek, 1988, p. 37). This perspective does not modify the general assumption, according to which these types of “more comprehensive deliberate organisation” are subsumed within the market, spontaneous, order. In fact, individuals and organizations can be associated as intentional actors which essentially differ only in their size, and: “as the overall spontaneous order expands, so the sizes of the units of which it consists grow” (Hayek, 1988, p. 37). But this point of view does not consider the internal structure of organization, which implies hierarchies, division of labour and the coexistence of general instructions and specific commands. This latter view implies that organizations should be examined more as multi-dimensional structures than as unitary, or indivisible, entities (see Fiori, 2000; Bensaïd, 2002, pp. 162-163). In short, on the one hand, Hayek suggests that the more an organization is governed by general rules and refers to the tacit and dispersed knowledge of its members, the more it improves its coordination, since its functioning is closer to that of spontaneous order.¹⁸ On the other hand, an organization – considered from the point of view of its internal configuration – is prevalently connoted by “specific commands”, “unitary hierarchy of ends”, and “fixed structures”, that is, characteristics which oppose organizations against spontaneous order (cf. Garrouste, 2002). Therefore, elaborating an *evolutionary theory of organization* on the basis of Hayek’s theory means setting aside this dichotomy and formulating a new perspective which “‘extract[s]’ some insights from his analysis” (Ioannides, 2003, p. 534). In other words, Hayek’s work comprises an

order.” (Hayek, 1973, p. 46, emphasis added). “Many of the individual and unique features of a particular corporation which make for its success are of the same character as the similar features of an individual person” (Hayek, 1967 [1959], p. 288).

¹⁸ “To some extent every organization must rely also on rules and not only on specific commands. The reason here is the same as that which makes it necessary for a spontaneous order to rely solely on rules: namely that by guiding the actions of individuals by rules rather than specific commands it is possible to make use of knowledge which nobody possesses as a whole” (Hayek, 1973, pp. 48-49). Note that all this occurs only “to some extent”. Cf. Langlois (1995, p. 258).

evolutionary view of neither firms nor central planning, *whose general characteristics reflect those of organizations at a different level* (hence, as previously pointed out, the opposition between the conceptions of economic systems as “economies” structured analogously to organizations, and as “spontaneous orders”). In fact, Hayek does not explain whether (and eventually how) constructivist orders evolve (cf. AUTHOR’S PAPER).

By way of contrast, the dichotomy between order and organizations does not apply to Simon’s approach. In particular, two arguments should be considered when comparing between the two authors: the notion of authority and the structure of decision-making within organizations.

In *A Formal Theory of the Employment Relationship* (1951), Simon developed some concepts dealt with in *Administrative Behavior* (1947, ch. 7) to show the advantages of an employment contract with respect to other forms of contracts (sales contract). The authority relationship between an employer and an employee does not consist – as it does for Hayek (1973, pp. 48-49) – in a set of “specific commands” imposed by the “commanding authority” to fulfil “assigned tasks”, although general rules sometimes can replace and/or moderate the use of precise commands. Rather, for Simon, the authority of the employer takes shape when the employee agrees to perform a range of actions, not previously specified in every detail, within an “area of acceptance”. In short, the employee agrees to undertake some tasks that will be chosen by the employer, since the possible behaviours that will be requested are indifferent for him/her. As a consequence, this kind of incomplete contract reduces the employer’s uncertainty as regards the employees’ future behaviours, with minimal cost for the latter. This advantage furnishes an answer (at least partial), to a recurrent question: “Why is so much of the world’s work performed in large, hierarchic organizations?” (Simon, 1979, p. 502).

Yet the notions of authority and of hierarchy exhibit other characteristics (see sect. 7), which were better defined after Simon (1951), and are connected to the view of decisional structure of organizations.

In fact, for Simon, more radically than in Hayek, an organization is defined by flexibility, changeable strategies, adaptive capabilities and responses, rather than by fulfilment of detailed plans: “Behavior in the organization is not determined in advance and once for all by a detailed blueprint and schedule” (March and Simon 1993 [1958], p. 45). Moreover, programs are essentially *strategies* to establish general courses of action, not “commands” (cf. Simon, 1991a, p. 32). “The term ‘program’ is not intended to connote complete rigidity. The content of the program may be adaptive to a large number of characteristics of the stimulus that initiates it” (March and Simon 1993 [1958], p. 163). In this context, a special role is played by the discretionary behaviours of members of organization, because “discretion”, amongst other things, means that “A program may specify only general goals, and leave unspecified the exact activities to be used in reaching them” (March and Simon 1993 [1958], p. 170; cf. pp. 211-212). Therefore: “Organizations are not highly centralized structures in which all the important decisions are made at the center”, and as in the market, their “decision processes are substantially decentralized” (Simon, 1996 [1969], p. 41).¹⁹ In short, firstly, the focal point is “to delegate within guidelines”, that is, define an intermediate point between absolute discretion of members and authority’s absolute power in making decisions (Simon, 1991a, p. 32). Secondly, such large decentralization in organizations is a condition for firms’ evolution, in that a number of novelties arise from the complex networks of decisional processes which characterize it, and as a consequence of organizational near-decomposability, i.e., the condition whereby departments of organizations exhibit a certain degree of independence which generates unforeseen changes in the aggregate (see sect. 7).

In conclusion, both firms and social planning, for Hayek - given their similar structures - are essentially connoted by centralization and vertical hierarchies. By

¹⁹ In the “Introductions” to the *Second Edition* (1957) and to the *Third Edition* (1976) of *Administrative Behavior*, Simon writes: “Discussion of administrative centralization and decentralization often bog down on the question: ‘Who *really* makes the decisions?’ Such a question is meaningless – a complex decision is like a great river, drawing from its many tributaries the innumerable component premises of which it is constituted. Many individuals and organization units contribute to every large decision, and the problem of centralization and decentralization is a problem of arranging this complex system into an effective scheme” (Simon, 1957 [1947], p. xii; Simon, 1976 [1947], p. xii).

contrast, for Simon they are largely characterized by decentralization compatible with vertical hierarchies which operate more by strategies than by specific commands (as his theory of complexity shows).

6.1 Economic systems as “organizational economies”: the Simon’s challenge

As shown in sections 2 and 3, a distinctive perspective, based on the coordinating role of organizations in modern economies, emerges in Simon’s work, since it directly challenges the theories which consider the market as the only (or prevalent) mechanism able to connect decentralized decisions.

Simon’s vision can be summarized as follows:

1) Markets perform important coordination functions among economic subjects, yet they are “only one [...] among the spectrum of mechanisms of coordination” For example, some coordination mechanisms are based on statistics, bargaining, negotiation, hierarchic organizations, adjustment of quantities, etc., and their mix characterizes different cultures and societies (Simon, 1996 [1969], p. 31). In particular, “[a] large part of the behavior of the system now takes place inside the skins of firms, and does not consist just of market exchange” (Simon, 1991a, p. 25).

More specifically, the economic units in capitalist societies are prevalently hierarchical organizations, and most of human economic activity “takes place in the internal environments of business and other organizations and not in the external, between-organization environments of market” (Simon, 1996 [1969], p. 31). Therefore, Simon suggests, the modern economies of industrialized societies should be described in terms of “organizational economies” instead of “market economies” (Simon, 1991a, p. 42), because “all economic activities are not left to market forces” (Simon, 1996 [1969], p. 35; see Simon *et al.*, 1992, p. 6).

2) The boundary between markets and organizations is movable; it is determined by “rather subtle forces”; and it “varies greatly from one society to another and from one time to another” (Simon, 1991a, pp. 41 and 29; 1996 [1969], pp. 31 and 40);

3) The prevalence of organizational economies with respect to the market is explained in historical terms as a process that leads from the latter to the former, in that “when Adam Smith was writing, markets dominated the economy of Britain, but in the two succeeding centuries markets have been steadily and rapidly displaced by large organizations” (Simon, 2005, p. xii; cfr. Simon, 2000, p. 751; Augier e Simon, 2003, p. 40).

Finally, in 1958, Simon judged the relation that Hayek established between BR and (market) complexity to be right in some respects, but incomplete. Hayek’s approach, according to which BR prevalently acts the more information is dispersed in the market, grasped only a part of the problem. Hayek, in his mature works, confirmed this view, pointing out that organizations, contrary to the market, are less complex entities. In fact, if the “limited resources” of an organization are known to the organizer, they can be managed for specific ends, and consequently organization is not a complex system.²⁰ More explicitly, organizations are “made orders”, and “Such orders are relatively *simple* or at least necessarily confined to such moderate degrees of complexity as the maker can still survey” (Hayek, 1973, p. 38). By contrast, according to Simon, not only the market, but also organizations exhibit high levels of complexity which cannot normally be mastered by the organizer’s bounded rationality, since, within organizations, “the ‘real’ situation is almost always far too complex to be handled in detail” (March and Simon 1993 [1958], p. 171).

7. Organizations and decentralization in light of the complexity approach

Simon’s view of the nature of organizations (as decentralized systems) also emerges in light of his explanation of complexity.

²⁰ “Where it is a question of using limited resources known to the organizer in the service of a unitary hierarchy of ends, an arrangement of organization (*taxis*) will be the more effective method. But where the task involves using knowledge dispersed among and accessible only to thousands or millions of separate individuals, the use of spontaneous ordering forces (*cosmos*) will be superior.” (Hayek, 1978 [1968], p. 76).

As previously shown, for Simon the distinction of boundaries between the market and organizations is a problematic issue. Every economic system exhibits a mix of planned and unplanned activities, which depends on the empirical features of those systems – as the socialist and capitalist experiences showed (Simon, 1996 [1969], p. 31). Moreover, the nature of boundaries between the market and organizations should be explained by referring to the notions of “hierarchy” and “near decomposability”, which in turn define the “architecture of complexity”:

“By a *hierarchic system*, or hierarchy, I mean a system that is composed of interrelated subsystems, each of the latter being, in turn, hierarchic in structure until we reach some lowest level of elementary subsystem.” (Simon, 1962a, p. 4)

This definition does not contradict the usual meaning of the term “hierarchy”, which implies vertical authority relations; rather, it has different, theoretical, implications. In fact, the concept of “hierarchy” is also described in terms of “Chinese boxes”, which “usually consists of a box enclosing a second box, which, in turn, encloses a third” (Simon 1973, p. 5), and so on, and this does not imply relations of subordination among the parts (the metaphorical boxes). This notion leads to a broad vision of the “architecture of complexity”, both in nature and in social structures, and in this context an explicit reference to organizations (which are hierarchies) appears, as in the following long quotation from the “Introduction to the Second Edition” (1993) of *Organizations*:

“Most of the organizations with which we deal are conventionally seen as hierarchies [...] Hierarchy has two, nearly independent, aspects. First, it refers to the boxes-within-boxes [that is, “Chinese boxes”] structure that characterizes most organizations, with generally more intensive communication within boxes at any level than between different boxes at that level. Second, hierarchy refers to the common pyramidal arrangement of formal authority relations, stepwise from “top” to the “bottom” of an organization.

The boxes-within-boxes character of hierarchy permits specialization of sub-units, keeping within bounds the amount of interaction and coordination among sub-units that is needed. At the same time, hierarchy facilitates the use of formal authority as a directing and coordinating mechanism.

Organizational processes are, however, not consistently hierarchical. They also involve networks of other types. They include flows of influence and control that go up and sideways as well as down. They reflect ecologies of interconnecting activities within which simple ideas of linear causal order and power are hard to sustain. They defy sharp definitions of organizational boundaries.” (March and Simon, 1993 [1958], p. 3).

The next step is to describe the “evolution” of complex systems. The concept is exemplified by the parable of two watchmakers, Tempus and Hora, whose work was constantly interrupted. The watches of both artisans comprised 1000 components. On each interruption Tempus put down the partly assembled component, which immediately disintegrated. On the contrary, Hora

“had designed [his watches] so that he could put together subassemblies of about ten elements each. Ten of these subassemblies, again, could be put together into a larger subassembly; and a system of ten of the latter subassemblies constituted the whole watch” (Simon, 1962a, p. 7, see Simon, 1973, p. 7).

In this way, Hora produced many more watches than Tempus. The basic idea is that this astounding result is achieved by the generation of layers of stable component subsystems, although the watches of both craftsmen have the same number of components. In short, Hora’s watches are *hierarchic complex systems*, while Tempus’ watches are not (Simon, 2002a, p. 591). Therefore, the conclusion is that “The time required for the evolution of a complex form from simple elements depends critically on the numbers and distribution of potential *intermediate stable forms*” (Simon, 1962a, p. 7; emphasis added).

This rule is general in nature, and it characterizes physical, social, political, and symbolic systems. It also involves biological evolution, where the existence of “intermediate stable forms” strongly influences the evolution of complex organic forms, since these act as building blocks for further construction (Simon, 1962a; 1973, pp. 11-19). From this perspective, the evolution of systems and their stability are closely related. In fact, if an intermediate (near independent) structure exhibits a greater adaptive capacity, it will improve the general efficiency, probably without requiring

change in the entire aggregate. This concept is represented by means of a biological example.

“Thinking of the evolution of organs as a problem in design, designing each organ to adapt to changing requirements will be much easier if the design of any one organ has little effect on the efficiency of the others; if the heart can be designed without redesigning the lungs, for instance” (Simon, 2000, p. 753).

Hence, complex systems are genuinely path-dependent, in that the history of their organizational structures matters. Moreover these latter at the same time confer stability on the system, and constitute the basis for the next evolutionary phases.²¹ This process is not teleological, in that complex forms randomly derive from the simpler ones, and the direction of change is consequently unpredictable, where stability is only a condition for survival. This property, which facilitates more rapid adaptation to a changing environment and characterizes stable and approximately independent structures, refers to the principle of “near-decomposability”, which is explained as follows:

“In hierarchic systems, we can distinguish between the interactions *among* subsystems, on the one hand, and the interactions *within* subsystems – i.e., among the parts of those subsystems – on the other” (Simon, 1962a, p. 11)

In a formal organization, Simon states, there is generally more interaction between two employees in the same department than between two employees in different departments.²² In short, a theory of *nearly decomposable* systems implies that “interactions among the subsystems are weak, but not negligible”, and shows that, in the short-run, the behaviour of each element of a system is approximately independent,

²¹ Nonetheless, according to Agre (2003, p. 417), “very little biological structure above the cellular level is assembled from previously independent modular components [and] [t]he modern corporation did not acquire most of its hierarchical structure by assembling existing components; rather, its leaders discovered through trial and error the need to impose such structures on it”.

while in the long-run it depends in “an aggregate way” on the behaviour of the other components (Simon, 1962a, p. 11). These characteristics are illustrated by the example of a building with thermal insulation against the external environment. The building is divided into a certain number of rooms (the subsystems), the walls of which constitute the boundaries of the main subsystems, and in turn each room is divided into cubicles with poor insulation. The initial, wide, thermal difference among the cubicles, and from room to room will gradually disappear; in particular it will be reduced first among the cubicles, and subsequently among rooms. This perspective also refers to organizations, since “departmental boundaries play very much the same role as the walls in our heat example” (Simon, 1962a, p. 13).

We can now re-examine the above metaphor of organizations as “Chinese boxes”:

1) organizations generally exhibit “more intensive communication within boxes at any level than between different boxes at that level” (March and Simon, 1993 [1958], p. 3), and each department is sufficiently independent;

2) hierarchy of organizations implies the formation of “sub-units” (that is, subsystems) which interact with each other (like the cubicles and the rooms in the building-complex system), although formal authority remains and performs a coordination function, defining more general aims than specific commands (cf. Simon, 2002b, p. 612);

3) organizations are not only connoted by vertical hierarchies; they also exhibit different kinds of networks. Therefore, they “defy sharp definitions of organizational boundaries.” (March and Simon, 1993 [1958], p. 3). More precisely, organization is a metaphorical box related to other boxes, and inside each box the boundaries are movable. Therefore, at different levels, the complex relation between the *independence* and *dependence* of these structures is reproduced.

²² Other examples are made, for example, Simon considers molecular and intermolecular forces, that is, interactions “within” and “among” molecules.

In short, organizations are hierarchic, nearly-decomposable, structures, and share the properties of complex systems (Simon 2002a; 2002b).²³ They have both a central decisional authority, and near independent sub-units, the components of which intensively interact *within* them, while interactions *among* the sub-units of the organizational aggregate are less intensive. Moreover, organizations are decentralized systems in which many important decisions are not made by top management (Simon, 1996 [1969], p. 41).

The lack of “sharp definitions of organizational boundaries” gives rise to an obvious problem: the relations between organizations and the market. The mechanism based on near-decomposability hierarchies must be applied in this case as well. In this perspective, an economic, complex, system appears prevalently as an aggregate composed of “intermediate stable forms” (organizations), which in their turn are divided into nearly independent sub-units. Markets do not disappear, rather “they are part of a wider framework of social institutions” (Simon, 1983, p. 76), especially organizations. As a consequence, economies must be conceived in terms of action of two systems, whose properties differ in that organizations, and the system which connect them as a network, exhibit near decomposability, whilst markets do not. In fact, “Markets are basically simple systems” (Simon, 2005, p. xii), i.e., perfectly decomposable structures which connect individual, independent, units (Augier, Simon, 2003, p. 40). Yet, when Simon depicts the relations among firms as if they were observed by an imaginary “visitor from Mars”, he stresses that firms (“large green areas”) are interconnected by “*market transactions*” (“red lines”) (Simon, 1991a, p. 27). This perspective delineates a conceptual problem, since relations among organizations (interpreted in light of near decomposability as “interactions *among* subsystems” - whereas the entire economic structure is the system) are now described in terms of “market transactions”. This view implies that the market should be considered as a *coherent part of a complex (near decomposable) system*, whose function is to connect stable, near decomposable, structures (firms). In short, this

²³ Among the various contributions which have developed analysis of organizations in the Simonian sense, in general and as complex systems, see Egidi (1992); Sanchez and Mahoney (1996); Grant, 1996;

perspective mirrors the notion of non-vertical hierarchy (the Chinese boxes), according to which the components of a complex system are not wholly independent one from the other but only nearly independent (Augier, Simon, 2003, p. 38).

As a consequence, the market seems to assume a double connotation: when it refers to organizations relationships, it is part of a near decomposable large system; when it coordinates individual components, it is a perfectly decomposable, non complex, system.²⁴ And, as we have seen, this issue derives from a historical process whereby the role of markets (in classical sense) has become increasingly residual with respect to that of organizations.²⁵

Finally, given this framework, the role of individuals is an essential point in the theory. On the one hand, agents are considered independent units in the context of the market (in the classical sense, for example, when they react to price signals), on the other hand, they are not the basic units for the coordination of complex systems; rather, the “intermediate stable forms” (organizations) accomplish this role and constitute the framework in which individual behaviour unfolds. An agent acts in social contexts, and this determines his preferences, beliefs, wants, identity and ideas (March and Simon, 1993 [1958], p. 13): he is (and “must be”) “organized and institutionalized”, and “must in his decisions be subject to the influence of the organized group in which he participates” (Simon, 1976 [1947], p. 102; cf. p. 109; Simon 1957 [1947], p. xv; Simon 1957, p. 196).

In other words, individuals are “institutionalized” by means of organizations, because their subjectivity and their capacity for problem solving, given their BR,

Frenken et al. (1999); Marengo and Dosi (2005).

²⁴ The market works when coordination among separate components does not require any “design”; if this is not so “the effectiveness of each component depends on the design of the other [and] we cannot depend on a pure market to bring about the desired coordination” (Augier, Simon, 2003, p. 41).

²⁵ Simon’s analysis of the market appears to be rather limited, and prevalently conducted in terms of comparison with organizations. Yet, the question of why some decisional problems are solved by organizations instead of the market is not left answered (cf. Heukelom, 2006, p. 17). In fact, Simon repeatedly maintains that organizations prevalently reduce the costs of coordination better than the market, and in any case “The choice between organization and markets depends on a comparison of these costs” (Augier and Simon, 2003, p. 41). As is well-known, a similar question, as regards the reasons for the existence of organizations, was posed by Coase in *The Nature of the Firm* (1937). Yet, assuming Simon’s perspective, the nature of problem could be reversed, asking why markets exist. Evidently, the answer is always grounded on the same empirical view, i.e., to identify when market coordination costs are inferior to those of organizations.

assumes a social form within organizations. This points out a further difference with respect to Hayek's approach, where the institutionalization of agents is accomplished by means of shared, general, rules of conduct arising from the cultural selection process to which actors' behaviours adhere. Therefore, the "institutionalization" of individuals is achieved in terms of a *direct relation* between agents and (social and market) order, because individuals following abstract rules generate spontaneous orders, and these latter in their turn influence their conduct (Hayek, 1967a, p. 76; cf. Lange-von Kulesa, 1997, p. 278)²⁶, while organizations do not play any special role in this process.²⁷

Conclusions

In this paper I have tried to show that Simon's and Hayek's works diverge in some important respects, although interesting similarities can be found (Rizzello, 1999; Bourguine, 2004; Egidio and Marengo 2004), and Simon himself recognized some merit in the Austrian economist's theory.

Yet the analysis has also pointed out Simon's distinctive view of planning as a *decentralized mechanism* which rejects both the "simple faith" on socialist central planning, and on the market (Simon, 1996 [1969], p. 34). His approach developed coherently over time, although it is more a set of connected concepts than a systematic theory. Nonetheless this relation exists. The issue is that planning is represented as an organizational problem (in both firms, and central administration), and exhibits a decentralized structure. Decentralization also characterizes the dynamic dimension of planning, because agents' decisions continuously modify the original, central, plan. Finally, decentralization characterizes complex systems (including economic ones), since hierarchy and near-decomposability impose a structure of near-independent units

²⁶ There is a huge body of literature on this topic, especially as regards the relation between group selection theory and methodological individualism. On this debate, and for references, see Hodgson (1993) and Caldwell (2000).

²⁷ One notes in passing that all this delineates two perspectives on the causes of stability in economic systems: in one case, stability is determined by means of "intermediate stable forms" (organizations), in the other, it emerges because individuals' behaviours refer to shared rules.

(organizations and their sub-units), which connotes economic systems as more organizational than market mechanisms, and constitutes conditions for the evolution of the aggregate.

All this clearly emerges from comparison with Hayek's theory (see table 1). In fact, analysis of British planning during World War II shows the different views of these authors on BR, planning, and the market. For Simon, contrary to Hayek, the notion of BR does not necessarily support arguments in favour of the price mechanism, and this is evident in wartime, when the price system is unable to coordinate agent's decisions, and (decentralized) planning replaces the market. Yet *Simon generalizes this conclusion*, because externalities, instability, and uncertainty of prices prevalently connote the market, which consequently cannot fulfil its coordination function. Moreover, planning (because of a continuous interaction between individual and institutional planners, the outcome of which is unpredictable) is something other than the category described by Hayek (which is related to that of "constructivism"). Therefore there is no room for the dichotomy between the market (spontaneous) order and social planning envisaged by the Austrian economist: "order without a planner" exists (Simon, 1996 [1969], p. 33), but it is not spontaneous, in Hayek's sense, in that is founded on a dynamic peculiar to planning structures. Finally, the concept of "organizational economy" as an alternative system of coordination with respect to the market is the last piece of Simon's puzzle, and it constitutes a perspective alternative to Hayek's approach, where the centrality of the market is a basic assumption.

Hayek	Simon
- BR as an argument in favour of the market (“a priori” assertion, in Simon’s view).	- BR is not necessarily an argument in favour of the market (empirical argument).
- Prices communicate reliable information, guide the decisions of rationally limited agents, and help coordination of their behaviours.	- If prices are “uncertain”, they do not communicate reliable information and reduce the ability of agents to respond rationally.
- The market is the sole economic decentralized mechanism.	- There are other economic decentralized systems (central planning, networks of organizations as global, economic, systems).
- Central planning implies centralization.	- Central planning implies decentralization.
- Central planning destroys evolutionary, market, forces.	- Global and local planning systems are interactive and evolutionary mechanisms.
- Organizations are connoted by specific commands, and by a “unitary hierarchy of ends”, although they also rely on “rules”.	- Organizations adopt general strategies more than commands. Formal authority and decisional decentralization co-exist.
- Organizations, as individual entities, are included in the market’s spontaneous order.	- Organizational economies prevail over market economies.

Table 1. Comparison between Hayek and Simon

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